

NOTES 01: DATA

Stat 120 | Fall 2025

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1 The Structure of Data

Cases

Variables

2 Types of Variables

Quantitative

Categorical

Explanatory

Response

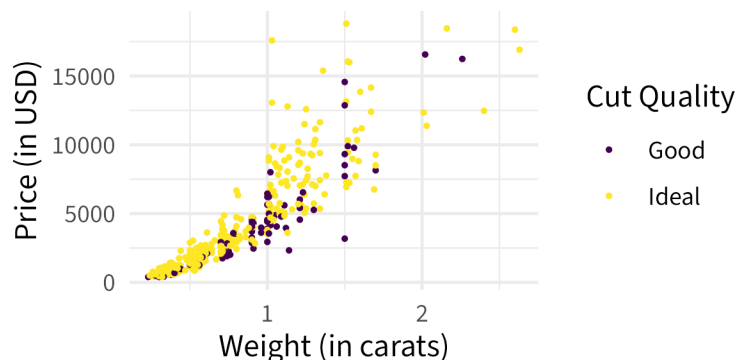
3 Examples

Label the cases and variables. For each variable, state whether it is categorical or quantitative. Indicate if there's clear response or explanatory variables

3.1 Penguins

```
# A tibble: 344 x 8
  species island bill_length_mm bill_depth_mm flipper_length_mm body_mass_g
  <fct>   <fct>         <dbl>         <dbl>         <int>         <int>
1 Adelia  Torgersen        39.1          18.7          181          3750
2 Adelia  Torgersen        39.5          17.4          186          3800
3 Adelia  Torgersen        40.3           18          195          3250
4 Adelia  Torgersen        NA            NA            NA            NA
5 Adelia  Torgersen        36.7          19.3          193          3450
6 Adelia  Torgersen        39.3          20.6          190          3650
7 Adelia  Torgersen        38.9          17.8          181          3625
8 Adelia  Torgersen        39.2          19.6          195          4675
9 Adelia  Torgersen        34.1          18.1          193          3475
10 Adelia Torgersen        42            20.2          190          4250
# i 334 more rows
# i 2 more variables: sex <fct>, year <int>
```

3.2 Price of diamonds by carat and cut quality



3.3 Is there a "Sprinting Gene"?

A gene called ACTN3 encodes a protein which functions in fast-twitch muscles. Some people have a variant of this gene that cannot yield this protein. To address the question of whether this gene is associated with sprinting ability, geneticists tested people from three different groups: world-class sprinters, world-class marathon runners, and a control group of non-athletes. In the same test, 6% of the sprinters had the gene variant, compared with 18% of non-athletes and 24% of the marathon runners.

Sketch out a possible dataset, and then answer the questions.